

TECHNICAL ABSTRACTS

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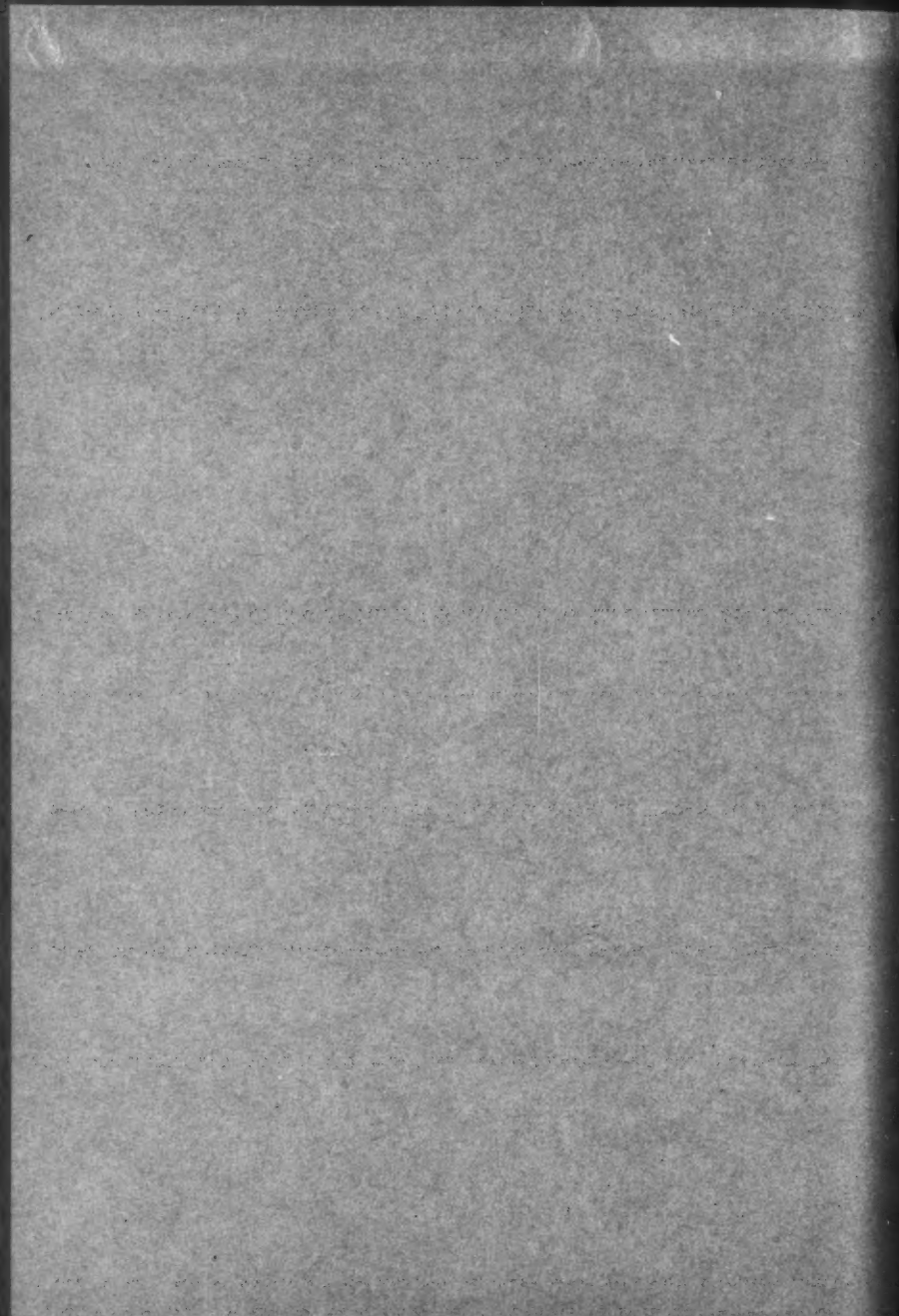
LEAD DEVELOPMENT ASSOCIATION

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LEAD ABSTRACTS

**A Selection of Abstracts of Literature and Patents
on the Utilisation of Lead
and its Alloys**

No. 4 JULY 1959

Technical Papers	173-209
Patents	210-242

**ISSUED BY THE
LEAD DEVELOPMENT ASSOCIATION
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PART I

TECHNICAL PAPERS

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ANALYSIS

- 173 DETERMINATION OF COPPER, LEAD, TIN AND ANTIMONY BY CONTROLLED-POTENTIAL ELECTROLYSIS. 3.—ADAPTATION OF THE METHOD TO THE ANALYSIS OF SOME ALLOYS** *B. Alfonsi*
Analyt. Chim. Acta, Dec., 1958, 19(6), 569-575.
Parts 1 and 2 were mentioned in No. 123, Technical Abstracts Vol. 1, No. 3, April, 1959. Various Alloys are considered and methods of analysis described.
-
- 174 RAPID DETERMINATION OF TIN, COPPER, LEAD, IRON AND NICKEL IN GUN-METAL AND BRONZES** *H. Wiedmann*
Z. Metallkunde, Oct., 1958, 49(10), 545-547.
(In German.) Control of foundry melts. Determination of lead with EDTA.
-
- 175 TITRIMETRIC ANALYSIS OF WHITE METALS** *L. J. Ottendorfer*
Chemist-Analyst, Dec., 1958, 47(4), 96, 101.
Analysis of lead-tin-antimony alloys involving EDTA titration for lead.
-
- 176 DETERMINATION OF PARTICULATE LEAD CONTENT IN AIR** *B. J. Tufts*
Anal. Chem., Feb., 1959, 31(2), 238-239.
Determination of concentration and sizes of lead-containing particles.
-
- 177 A FIELD METHOD FOR DETERMINATION OF LEAD FUME** *B. E. Dixon and P. Metson*
Analyst, Jan., 1959, 84, 46-50.
Determination based on formation of a purple colour on test paper impregnated with tetrahydroxyparabenzquinone.
-

BEARINGS

- 178 BABBITTING BEARINGS BY CENTRIFUGAL FORCE** *W. B. Keyser*
Met. Progress, Nov., 1958, 74(5), 90-91.
Centrifugal bonding of babbitt metal to leaded bronze. Practical details using Tin-Kwik flux.

CERAMICS

179 CERAMIC AND DIELECTRIC PROPERTIES OF LEAD METANIOPATE ELECTRICAL CERAMICS

*K. E. Nelson and
R. L. Cook*

Journal of the American Ceramic Society, March, 1959, 42(3), p. 138.

Up to 0.7 mole fraction of the lead was replaced by cadmium and the effects of these replacements were investigated. The results of firing at different times and temperatures were also investigated.

COATINGS

180 45th ANNUAL TECHNICAL PROCEEDINGS OF THE AMERICAN ELECTROPLATERS' SOCIETY, 1958

*American
Electroplaters'
Society*

Book, 1958, 184 pp. A.E.S., 445 Broad Street, Newark, N.J. \$15.

Twenty-three papers and discussions are reported, including:—

ALLOY PLATING SYSTEMS FOR AIRCRAFT ENGINES

B. E. Scott

Pp. 93-96, 165. Includes description of practice for lead-indium and lead-tin plating of bearings at Wright Aeronautical Division of Curtiss-Wright Corp.

181 STRIPPING METALLIC COATINGS

J. B. Mohler

Met. Finishing, Dec., 1958, 56(12), 60-63.

General survey of stripping methods. Lists particular methods for stripping lead from steel and chromium, gold from lead, silver from white metal, etc.

182 CONTINUOUS X-RAY MEASUREMENT OF PLATING THICKNESS

*P. S. Goodwin and
C. L. Winchester*

Plating, Jan., 1959, 46(1), 41-44.

Measurement of coating thickness using X-ray fluorescence radiation. Two methods are described and the choice depends on thickness, mass absorption coefficient and density of coating. A description is given of the apparatus. Reference to results with various plated coatings on lead and other metals.

CORROSION

183 OXIDATION OF LEAD IN WATER IN THE PRESENCE OF ATMOSPHERIC OXYGEN

*B. S. Bric,
J. Sifter and
I. Limpel*

Corrosion et Anticorrosion, Oct., 1958, 6(10), 342-345.

(In French.) Preparation of yellow or red oxide by oxidation of lead in water with atmospheric oxygen present. Oxidation related to time and temperature.

184 THE CORROSION OF VALVES AND PUMP IMPELLERS IN A HIGH PRESSURE HOT WATER HEATING SYSTEM

J. C. Spurr

Canad. Dept. of National Defence, Defence Research Board, Lab. Note NR-DL2/57, Sept., 1957, 16 pp.

Cavitation and/or impingement attack is blamed for the wasting of 85/5/5 leaded gun-metal pump impeller in a high pressure hot water system (pH 10.5 - 11).

185 LEAD ALLOY Pb-Sb-Ag ANODE FOR CATHODIC PROTECTION

J. H. Morgan

Corrosion Tech., Nov., 1958, 5(11), 347-352.

Method of operation of the anode is described, including the formation of the conducting oxide film in sea-water. Performance is described for protection of ships' hulls and industrial plant.

186 CORROSION OF METALS BY VAPOURS FROM ORGANIC MATERIALS: A SURVEY

*V. E. Rance and
H. G. Cole*

Booklet, 1958, 27 pp. HMSO 2s.

Survey of attack by vapours from glues, varnishes, paints, plastics, wood and micro-organisms, on various metals including lead.

187 APPLICATION OF LEAD/ACID BRICK SYSTEMS IN CHEMICAL PLANTS

E. J. Mullarkey

Corrosion, Feb., 1959, 15(2), 98-102 (even).

Techniques of installation of acid bricks to protect lead against abrasive conditions. Radioactive tracers are used to locate leaks.

188 STUDIES ON THE BEHAVIOUR OF NON-DRYING OILS AND GREASES WITH SPECIAL REFERENCE TO MODERN LUBRICANTS AND METAL PROTECTIVES

A. Bukowiecki

Schweizer Archiv, Jan., Feb., 1959, 25(1, 2), 23-34, 62-74.

(In German.) Describes experiments on attack on metals. Materials considered in conjunction with lead include hot sulphur-containing oils, motor oils (also considered with lead bronze bearings), wet paraffin with or without acid, or stearic acid, wet diesel fuels.

CREEP AND FATIGUE

189 THE DEPENDENCE OF MICROCREEP PROPERTIES ON THE DEVELOPMENT OF FATIGUE IN LEAD (AND ANTIMONY)

A. J. Kennedy

J. Inst. Metals, Jan., 1959, 87(5), 145-149.

Concludes that microcreep is sensitive to fatigue development and that measurements of microcreep with superimposed fatigue stress may give indication of fatigue damage. Lead used in tests is 99.98% pure.

ELECTROCHEMISTRY

190 PROCEEDINGS OF THE EIGHTH MEETING (OF C.I.T.C.E.), MADRID, 1956

*International
Committee of
Electrochemical
Thermodynamics
and Kinetics*

Book, 1958, 497 pp., Butterworths Scientific Publications, 88 Kingsway, London, W.C.2, £4 15s. 0d.

Contains 42 papers grouped under various headings, including Corrosion, Protection against Corrosion, Batteries and Accumulators.

ELECTRONIC

191 INFRA-RED PYROMETRY FOR MEASURING THE TEMPERATURES OF TURBINE BLADES

*J. Crabol and
J. van Kote*

Recherches Aeronautique, Sept.-Oct., 1958, No. 66, pp. 3-11.

Blade temperatures between 400°C and 1000°C can be measured using a lead-sulphide photocell.

LEAD — GENERAL

192 LEAD AND ITS ALLOYS (AS CHEMICAL ENGINEERING MATERIALS OF CONSTRUCTION)

E. J. Mullarkey

Ind. Eng. Chem., Sept., 1958, 50(9, 2), 1449-1454.

General discussion on progress in use and research, with wide coverage of properties and literature.

193 GASKETING FOR LIQUID OXYGEN

*J. Swift and
D. C. Bowersock, Jr.*

Kelvin Scale Research and Engineering, Sept., 1958, 1(1), 2-3. (Leaflet issued by Arthur D. Little Inc., Cambridge, Mass.)

Various materials were tried as gaskets between 6" flanges of a stainless steel vessel holding liquid oxygen. Lead was financially a close second to aluminium, but it had the advantage that it could be cut with an ordinary gasket knife.

194 YUGOSLAVIA'S NON-FERROUS METALS

E. Djakovic

Brochure, 1958, 24 pp. Edition "Yugoslavia," Terazije 31, Belgrade, Yugoslavia. Outline of current mining and production in Yugoslavia, with brief history. Covers lead and other non-ferrous metals.

195 THE SITUATION OF THE LEAD AND ZINC MINING INDUSTRY IN EUROPE

Non-Ferrous Metals Committee, O.E.E.C.

OEEC Report, Sept., 1958, 50 pp.

Difficulties facing lead and zinc mining industries due to price falls in 1957 are reviewed. Labour problems and market conditions, etc., in America and Europe are described in annex to report.

196 HIGH-PURITY METALS IN COMMERCIAL QUANTITIES

R. A. King

Met. Progress, Jan., 1959, 75(1), 127-130.

Methods of purification, analysis and control to produce high-purity lead and other metals.

197 AMERICAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM ENGINEERS: TECHNICAL PROGRAMME OF THE ANNUAL MEETING OF THE METALLURGICAL SOCIETY OF AIME, FEBRUARY 15-19, 1959, SAN FRANCISCO

AIME Metallurgical Society

Journal of Metals (U.S.A.), Jan., 1959, 11(1), 57-59.

Papers are listed and some abstracts are given. Subjects include the extraction of lead.

1958 BOOK OF ASTM STANDARDS INCLUDING TENTATIVES

(A triennial publication.)

PART 2.—NON-FERROUS METALS (SPECIFICATIONS AND ELECTRONIC MATERIALS)

1,354 pp., \$10.

Covers non-ferrous metals specifications and electronic materials. Contains 251 standards covering lead, solder, bearing metal and other materials.

198 NOVEL DESIGNS TAME TOUGH CORROSIVES

R. B. Norden

Chemical Engineering, Vol. 66, No. 2, p. 130, Jan. 26, 1959.

Lead-lined steel protected with acid-proof bricks faced with carbon bricks are used for leaching reactors at the nickel plant of Freeport Sulphur Company at Moa Bay.

199 CORROSION INHIBITORS IN AUTOMOTIVE COOLANTS

M. Levy

Ind. and Eng. Chem., Vol. 51, No. 2, page 209, Feb., 1959.

Studies on polarization of solder and copper.

- 200 PHOTOCHEMICAL PROCESSES IN THIN SINGLE CRYSTALS OF SILVER BROMIDE: THE DISTRIBUTION AND BEHAVIOUR OF LATENT-IMAGE AND OF PHOTOLYTIC SILVER IN PURE CRYSTALS AND IN CRYSTALS CONTAINING FOREIGN CATIONS**

*W. West and
V. I. Saunders*

The Journal of Physical Chem., Vol. 63, No. 1, page 45, Jan., 1959.
Effect of lead and other ions is discussed.

METALLURGY

- 201 SURFACE DEFORMATION DIFFERENCES BETWEEN LEAD FATIGUED IN AIR AND IN PARTIAL VACUUM**

*K. U. Snowden and
J. N. Greenwood*

Trans. A.I.M.E. Met. Soc., Oct., 1958, 212(5), 626-627.

- 202 AUTOMATIC CASTING OF ANODES AT THE SAN GAVINO FOUNDRY**

E. Freni

Metallurgia Italiana, Nov., 1958, 50(11), 473-483.

(In Italian.) Description of over twelve months' operations at San Gavino. Monreale smelter with fully automatic plants. Production is stated to be 28 tons per hour with one operator.

- 203 GRAIN BOUNDARY MIGRATION IN HIGH-PURITY LEAD AND DILUTE LEAD-TIN ALLOYS**

*K. T. Aust and
J. W. Rutter*

Trans. AIME Met. Soc., Feb., 1959, 215(1), 119-127.

Investigation of the movement of individual grain boundaries under constant driving force in refined lead and lead with small additions of tin. Driving force is provided by "striation" substructure.

PHYSICAL PROPERTIES

- 204 PROPAGATION OF SOUND IN LIQUID METALS: VELOCITY IN LEAD AND TIN**

R. B. Gordon

Acta Metallurgica, Jan., 1959, 7(1), 1-7.

Increasing temperature gives linear decrease of sonic velocity (longitudinal sound waves).

SMEETING

- 205 CHLORIDE VOLATILISATION OF OXIDISED LEAD ORE FROM EUREKA, NEVADA**

*A. L. Engel and
H. J. Heinen*

(U.S.) Bur. Mines Rep. Inv. 5409, 1958, 7 pp., Washington, D.C.

Treatment of oxidised ore with calcium chloride in an oxidising atmosphere results in the extraction of 91% lead.

206 REDUCTION OF METALLIC OXIDES WITH CARBON MONOXIDE *J. Weber*

Kohaszati Lapok, Feb.-March, 1958, 91(2-3), 122-130.

(In Hungarian.) Thermodynamics of the reduction of oxides of many metals including lead.

207 EFFECT OF ANTIMONY ON THE DROSSING RATE OF LEAD *J. E. A. Gooden*

Trans. Inst. Min. Met., 1958-59, 68(4), 145-150. (Bull. Inst. Min. Met., Jan., 1959, No. 626, pp. 145-150).

Low concentrations of antimony increase drossing rate. Radioactive antimony used to investigate effect of low concentrations down to 10-7%.

SOLDERS

208 SOLDERABILITY OF PIGTAIL LEADS *R. M. Evans and R. E. Monroe*

3rd (U.S.) Electronic Industries Assoc., Conf. on Reliable Electrical Connections, Dec., 1958 (reprint), 9 pp.

Pigtail leads (wire contacts) on electronic components are tested for solderability with 60/40 lead-tin solder under controlled conditions. The effect of ageing on solderability is considered.

WELDING

209 CONFERENCE ON PRESSURE WELDING OF METALS, UNIVERSITY OF BIRMINGHAM, JUNE 19, 1958 *University of Birmingham
Dept. of Industrial Metallurgy*

Brit. Welding J., Jan., 1959, 6(1), 1-37.

"Pressure Welding by Rolling" by L. R. Vaidyanath, M. G. Nicholas and D. R. Milner, which includes measurement of bond strength for lead; and

"Influence of Relative Interfacial Movement and Frictional Restraint in Cold Pressure Welding" by E. Holmes, which considers welding of copper to lead.

PART II

PATENTS

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ALLOYS

210 BRITISH PATENT 811,404. "LEAD ALLOY"

BRITISH LEAD MILLS LTD.

This patent refers to the alloy known as "Antatac R1." The composition is given as 0.02/0.1% Ag, 0.04/0.65% Te, and 0.20/12.5% Sb, Bal. Pb. With the antimony in the range of 3.5/8.0%, the alloy is hard and can be shaped only by casting and machining. Outside this range but within the composition given in the patent, the material is malleable and can be rolled. It is mostly used in systems of corrosion prevention by impressed currents and in the manufacture of linings for electroplating vats.

211 GERMAN PATENT 1,025,152. "PRODUCTION OF ALLOYS OF LEAD AND ALKALI METALS"

SOLVAY ET CIE

A lead amalgam is mixed with an amalgam of the alkali metal or metals and the mercury is then removed by distillation.

BATTERIES

212 GERMAN PATENT 1,055,628. "LEAD ELECTRODES FOR BATTERIES"

W. HEBERER

The active lead pastes are mixed with powdered plastic, and the whole heated, after shaping, to the sintering temperature of the plastic. The resulting unit is a porous plastic structure in which the lead compounds are held in a finely dispersed form.

213 BRITISH PATENT 810,175. "BATTERY PLATES"

ACCUMULATOREN-FABRICK A.G.

Plates made of lead alloy containing 6% of mercury have 53% greater durability than those made from the normal lead antimony alloy. Usually it is necessary to make only the positive grid from this alloy but in cases where low, self discharge characteristics are important, the alloy should be used for the negative grid also.

214 GERMAN PATENT 1,052,121. "GRID ALLOY"

ELECTRIC STORAGE BATTERY CO.

This patent describes a grid alloy made of 0.15/1.0% As, 0.04/0.6% Ag, 4/8% Sb, Bal. Pb.

215 SOUTH AFRICAN PATENT 4689/58. "SEPARATORS"

W. R. GRACE & CO.

The feature of this separator is that the ribs are formed by a material which expands when immersed in the electrolyte. An example is given of 80 to 130 parts of Vollastone and 60 to 95 parts of plasticizer per 100 parts of PVC.

216 BRITISH PATENT 801,211. "TUBULAR CONTAINERS FOR ACTIVE MATERIAL"

CHLORIDE BATTERIES LTD.

The lead pastes are enclosed in microporous plastic tubes. Each of which is externally covered with a braided, woven or knitted fabric.

217 BRITISH PATENT 812,669. "SECONDARY BATTERY"

S. RUBEN

The electrodes in this cell are made of inactive material such as graphitised aluminium or lead plated aluminium and the electrolyte is a solution of lead sulphamate and sulphamic acid. The advantages claimed are that the cell can be stored in a discharged condition for long periods without deterioration. The unit will produce a voltage of about 1.6 v.

218 BRITISH PATENT 812,537. "BATTERY GRID METAL"

GOULD-NATIONAL BATTERIES INC.

The specification of the metal is 0.5/3.0% Sn, 0.2/0.5% As, and 0.05/0.35% Ag. Grids made from this metal are claimed to be superior to the conventional antimonial alloy grids because they are less liable to corrode and reduce the self-discharge of plates.

219 AUSTRALIAN PATENT 40610/58. "TUBULAR TYPE ELECTRODE"

CHLORIDE BATTERIES LTD.

The tubes to contain the active lead pastes are made in two parts. The inner cylinder is a thin glass-fibre lining and the exterior is composed of knitted, woven or braided yarn resistant to oxidation. Both units are coated with an acid-resisting resin without blocking the interstices and on curing the resin fuses the whole together.

220 BRITISH PATENT 789,052. "PRIMARY BATTERY"

P. R. MALLORY & CO. INC.

This dry cell has an anode of molybdenum or stainless steel, dry tin sulphate as the electrolyte and a cathode of equal parts of barium permanganate and lead dioxide.

221 BRITISH PATENT 809,640. "METHOD OF FORMING NEGATIVE PLATE"

NATIONAL LEAD CO.

The lead compound, preferably litharge, is held in the grid (made, for instance, of antimonial lead) and there reduced by hydrogen or carbon monoxide. The temperature of the reaction should not exceed 245°C, but an elevated pressure, about 215 lbs/sq. in., can be used with advantage.

222 GERMAN PATENT 1,016,334. "REMOVING WATER FROM A PLATE AFTER FORMING"

TUDOR ABT.

The plate is immersed in a liquid hydrocarbon and the temperature raised above 100°C. The water boils off and the hydrocarbon reacts with the lead of the plate to form an organo-lead compound. The compound forms a protective coating, but reacts with and is removed by the battery acid at a later stage. Lead compounds so treated are claimed to be especially active if heavy currents are required. If kerosene is used the temperature at which the water is expelled should be 120/150°C.

223 BRITISH PATENT 799,308. "BATTERY GRIDS"

BRITISH ELECTRICAL AND ALLIED INDUSTRIES RESEARCH ASSOCN.

This patent describes grids for lead acid batteries made from a mixture of a plastic which is inert in the environment of the cell, and a lead oxide. The plastic may be, for preference P.V.C., polythene or polystyrene, and lead dioxide is chosen for the positive and grey oxide for the negative.

CABLES

224 BRITISH PATENT 808,415. "DIE HEAD FOR CABLE SHEATHING PRESS"

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD. and F. T. GRIFFITHS

Die head for cable sheathing extrusion plant designed to prevent residual stress in the product.

CLADDING

225 GERMAN PATENT 1,053,276. "LINING TUBES WITH LEAD"

I. HENGEN & CO.

The device described produces a homogeneous lead lining to a steel tube or similar article. The tube, which is externally heated, is placed vertically in a bath of molten lead. In the bottom of the tube there is a piston, the diameter of which is smaller than that of the tube. The piston is raised, thereby lifting a plug of molten lead which flows outside but solidifies before reaching its lower end, producing a thick inner lining to the steel tube. The upper end of the tube is sealed so that the pressure within may be regulated; an overflow is provided for the excess molten lead.

226 GERMAN PATENT 1,053,895. "CLADDING OF METAL STRIP"

BRITISH IRON & STEEL RESEARCH ASSOCIATION

The molten metal is withdrawn from the reservoir on to the strip by devices which have a motion relative to the strip. The coating is applied by a roller immersed in the molten metal, the circumference of which is moving at a speed different from that of the strip.

ELECTRONICS

227 GERMAN PATENT 1,022,327. "FORMATION OF LAYERED LEAD SULPHIDE"

PHILIPS N.V.

Layers of lead sulphide sensitive to radiation, photoconductive and semiconducting, may be deposited by heating a mixture of lead acetate, thiourea and hydrazine to temperatures over 50°C.

228 BRITISH PATENT 806,640. "Pb-Se-S THERMOELECTRIC ELEMENTS"

BASO INC.

The patent describes thermoelectric elements made of lead, selenium and sulphur, which have high thermoelectric power but low electrical resistance.

229 GERMAN PATENT 1,052,001. "PHOTOELECTRIC CELL"

GENERAL ELECTRIC CO.

This cell consists of an electric conducting base on which there is deposited an adherent layer consisting of orthorhombic lead oxide. The latter may be made by heating a layer of a suitable lead compound until it is all converted to the desired lead oxide.

EXPLOSIVES

230 GERMAN PATENT 1,036,735. "COATINGS ON LEAD AZIDE"

PYNAMIT A.G.

The ignition sensitivity of lead azide primers may be improved by coating them sparingly with soluble chromates, plumbates or manganates. Preferably a mixture of lead azide and basic lead azide may be reacted with a soluble chromate, plumbate or manganate at a pH of 1 to 4.

GLASS

231 AUSTRALIAN PATENT 40598/58. "LEAD BORATE GLASS"

CORNING GLASS WORKS

Lead borate glasses can be dissolved by nitric acid in the range of 0.5N to 2.5N.

METALLURGY

232 BRITISH PATENT 809,470. "BONDING ALUMINIUM TO COPPER-LEAD ALLOY"

BORG-WARNER CORPORATION

The aluminium unit is first plated with nickel, and then the nickel surface is tinned. The pre-tinned copper lead component is next placed in contact, and the whole heated to 500/700°F under pressure. The process can be used for attaching a copper nickel bush to a housing of aluminium or aluminium alloy.

MINING

233 SOUTH AFRICAN PATENT 46/59. "THE FLOTATION OF LEAD VANADATE"

S. WEST AFRICA CO. LTD.

The ground vandate is treated with an aqueous solution of a soluble lead salt which serves as an activator for the vandate. The complete mixture, containing the collector and frothing agent, is adjusted to have a pH of 8.5 or higher.

OXIDES

234 BRITISH PATENT 812,785. "PREPARATION OF RED LEAD"

J. d'ANS & OTHERS

Red lead having a particle size of less than 0.1 microns is produced by oxidising a divalent lead compound in an aqueous medium at controlled temperature and Ph. A wide range of lead compounds can be used for starting materials and a suitable oxidising agent is sodium hypochlorite.

SMELTING

235 BRITISH PATENT 812,837. "COOLING DEVICE FOR MOLTEN LEAD"
NATIONAL SMELTING CO. LTD.

In the blast furnace production of metallic zinc, lead is used as a cooling medium. It is necessary to remove heat from this liquid and a method of doing this by using a water-cooled rotating steel drum is described.

236 GERMAN PATENT 1,055,824. "LEAD AS A SOLVENT IN THE PRODUCTION OF ZINC"

E. PAULING

Zinc oxide is reduced in the presence of a solvent such as molten lead from which it can subsequently be recovered by distillation at reduced pressure. This method enables lower temperatures to be used while maintaining or even increasing the rate of reaction.

237 GERMAN PATENT 1,052,693. "THE CONDENSATION OF ZINC VAPOUR" METALLURGICAL PROCESSES LTD.

This patent is substantially the same as British Patent No. 812,837 (page 15).

238 BRITISH PATENT 810,158. "CONDENSATION OF ZINC VAPOUR"

NATIONAL SMELTING CO.

This patent describes the modification to the condenser unit used in connection with blast furnace production of zinc. In this system, the zinc is used as a condensing medium and the heat content is removed by circulating a layer of cool molten lead below it. The lead is withdrawn, cooled and returned. The volumes are adjusted so that there is not an undue solubility of zinc in the lead.

239 SOUTH AFRICAN PATENT 2601/58. "RECOVERING PRECIOUS METALS FROM THE ORES OF LEAD, ETC."

SHERITT GORDON MINES LTD.

The pulverised material is first roasted in a non-oxidising atmosphere at between 470°C and the fusion temperature, to drive off arsenic, antimony, etc., as sulphides. The mass is then made into an aqueous slurry with acid sulphate and heated under pressure to 90/190°C in an oxidising atmosphere, when sulphur is produced as liquid globules which occlude untreated base metal ore. The sulphur globules together with the latter material are removed in the form of solid sulphur pellets and returned to the roasting process. The residue in the slurry is treated for precious metals, etc.

SOLDERS

240 BRITISH PATENT 807,731. "SOLDERING THE ATTACHMENTS OF ELECTRICAL COMPONENTS TO PRINTED CIRCUITS"

GENERAL ELECTRIC CO. LTD. and R. D. RUNCIMAN

The circuit, except in the vicinity of the holes, is first coated with a varnish which is heat and abrasion resistant. The wires are then inserted, cleaned by abrasion and soldered by dipping.

241 BRITISH PATENT 809,724. "APPARATUS FOR DIP-SOLDERING PRINTED CIRCUITS"

STANDARD TELEPHONES AND CABLES LTD.

The circuit is dipped into molten solder and afterwards wiped.

TUBES

242 BRITISH PATENT 810,668. "ATTACHMENT TO COLLAPSIBLE TUBE"

W. HARRIS

This patent describes an attachment to the outlet of a collapsible tube to effect the inward withdrawal of the residual paste at this point.

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